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PATENT APPLICATION

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Sir:

Transmitted herewith for filing under 37 CFR 1.53(b) is a(n): ☒ Utility ( ) Design☒ original patent application,

( ) continuation-in-part application

INVENTOR(S): **Maher et al.**TITLE: **METHOD AND SYSTEM OF PRINTING IDENTIFICATION CARD (ID) USING AN INKJET PRINTER**

Enclosed are:

- ☒ The Declaration and Power of Attorney. ( ) signed ☒ unsigned or partially signed  
☒ 2 sheets of drawings (one set) ( ) Associate Power of Attorney  
( ) Form PTO-1449 ( ) Information Disclosure Statement and Form PTO-1449  
( ) Priority document(s) ( ) (Other) \_\_\_\_\_ (fee \$ \_\_\_\_\_)

CLAIMS AS FILED BY OTHER THAN A SMALL ENTITY				
(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) TOTALS
TOTAL CLAIMS	19 — 20	0	X \$18	\$ 0
INDEPENDENT CLAIMS	2 — 3	0	X \$80	\$ 0
ANY MULTIPLE DEPENDENT CLAIMS	0		\$270	\$ 0
BASIC FEE: Design ( \$320.00 ); Utility ( \$710.00 )				\$ 710
TOTAL FILING FEE				\$ 710
OTHER FEES				\$
TOTAL CHARGES TO DEPOSIT ACCOUNT				\$ 710

Charge \$ 710 to Deposit Account 08-2025. At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16, 1.17, 1.19, 1.20 and 1.21. A duplicate copy of this sheet is enclosed.

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By Edmond A. DeFrank  
Typed Name: **Edmond A. DeFrank**

Respectfully submitted,

**Maher et al.**By Edmond A. DeFrank**Edmond A. DeFrank**

Attorney/Agent for Applicant(s)

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**METHOD AND SYSTEM OF PRINTING  
IDENTIFICATION CARD (ID) USING AN INKJET PRINTER**

By Maher et al.

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**FIELD OF THE INVENTION**

The present invention generally relates to a novel printing system for printing identification cards with durable full-color images using an inkjet printing device.

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**BACKGROUND OF THE INVENTION**

In recent years, identification (ID) cards have become very prevalent in our society. Some examples of these cards include driver's licenses, employee identification cards, club membership cards, bond cards and insurance cards. As is well known, these cards are often carried in wallets and purses and most of them are handled numerous times over their life span. As a result, ID cards are prone to wear and tear.

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Over the years, different methods have been used to produce these ID cards. For example, one method involves printing images using conventional printing equipment on heavy paper that is either pre-cut or cut thereafter into card sizes. These ID cards are very inexpensive to produce. However, due to the constant handling of these cards, they often succumb prematurely to wear and tear.

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A more durable technique of producing these ID cards involves printing images on a plastic card. Plastic is sturdier than heavy paper and consequently, the ID cards thus produced are less prone to wear and tear than the heavy paper ID cards. However, the images printed on the cards have a tendency to fade away gradually with each usage. In addition, special printing equipment has to be used to print the images on the cards.

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To circumvent the gradual fading of the images on the plastic and paper ID cards, the cards are sometimes laminated. For plastic cards, this can be accomplished by bonding a thin clear plastic material over the side of the cards that has the imprinted images. This is often achieved by compressing the clear plastic material onto the plastic card under heat.

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One of the types of special printing equipment that is used to produce

the plastic ID cards involves employing dye diffusion thermal transfer (D2T2) technology. D2T2 uses a thermal printhead to print an image on a card to allow relatively easy printing of images on plastic ID cards. However, D2T2 has several drawbacks. For example, the material used in D2T2 technology is expensive and not widely available. In addition, the thermal printhead itself is susceptible to contamination and can damage the printhead. Further, D2T2 printers are not capable of producing high quality photo images because the inks they use do not mix well enough together to produce a high gamut of colors.

Consequently, what is needed is a method of printing ID cards that is relatively inexpensive and widely available and that offers a wide array of colors for producing ID cards with high quality images.

### **SUMMARY OF THE INVENTION**

To overcome the limitations in the prior art described above, and to overcome other limitations that will become apparent upon reading and understanding the present specification, the present invention is embodied in a printing system for printing identification cards with durable full-color images using inkjet printing technology.

In general, the present invention provides an inkjet printer that is used to print images on a plastic ID card. The images are processed by a host computer and translated and transposed to form mirror images (reverse images). The reverse images are printed on suitable transparent media, such as specially coated polyester media, preferably in roll form. The transparent media is then laminated onto a plastic card. The side with the printed images is then adhered to the card.

As a result, the images are viewed as being printed correctly on the transparent media. Further, the images are protected on one side by the transparent media itself and on the other side by the plastic card.

Consequently, the images are fairly durable. The edges of the transparent media can be cut automatically so that they are flush with the edge of the plastic card. The card is then ejected to an output area, and is ready to use.

Other aspects and advantages of the present invention as well as a more complete understanding thereof will become apparent from the following

detailed description, taken in conjunction with the accompanying drawings, illustrating by way of example the principles of the invention. Moreover, it is intended that the scope of the invention be limited by the claims and not by the preceding summary or the following detailed description.

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### **BRIEF DESCRIPTION OF THE DRAWINGS**

The present invention can be further understood by reference to the following description and attached drawings that illustrate the preferred embodiment. Other features and advantages will be apparent from the following detailed description of the preferred embodiment, taken in conjunction with the accompanying drawings, which illustrate, by way of example, the principles of the invention.

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FIG. 1 depicts a block diagram of an ID card issuing system of the present invention.

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FIG. 2 illustrates a reverse printed image.

FIG. 3 depicts a mirror image of the reversibly printed image of FIG. 2.

### **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

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In the following description of the invention, reference is made to the accompanying drawings, which form a part hereof, and in which is shown by way of illustration a specific example in which the invention may be practiced. It is to be understood that other embodiments may be utilized and structural changes may be made without departing from the scope of the present invention.

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#### **I. GENERAL OVERVIEW:**

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With reference now to the figures, FIG. 1 depicts a block diagram of an identification (ID) card printing and issuing system according to the present invention. The ID card printing and issuing system comprises an image processing controller 100 and some input and output devices. The input devices include a scanner 105, a camera 110, a keyboard 115 and a mouse 120. The output devices include a display terminal 125, and a printer 130.

The image processing controller 100 can be software driven or a

processor of a personal computer, although not restricted as such, with the requisite operating system (OS) and different memory devices (i.e., random access memory (RAM), read-only-memory (ROM), as well as hard and floppy disks to store data. The memory devices are used to store device drivers for each device, the OS as well as the different application programs that may be needed. One of these application programs may be the program needed to use the personal computer as an ID card issuing system.

The scanner 105 is used to input image data such as writing, graphic or photographic data into the system. For example, the photograph of a person may be scanned into the system. The person's signature and any relevant information about the person may also be scanned into the system. Relevant information includes name, address, height, weight, date of birth, card number, expiration date of card etc.

The camera 110 may be used to take photographs of individuals as well as photographs of relevant data about the individuals. The camera may either be a digital or a non-digital camera. If it is a non-digital camera, then a digitizer is needed to convert the photographs into digital data for later use. The keyboard 115 and mouse 120 may also be used to enter the relevant information about the individual into the system. The display system 125 is used as display systems are conventionally used. For example, it may be used to see what will be printed on the ID card before the image is actually printed on the card.

The printer 130, in accordance with the present invention, is an inkjet printing device with a suitable inkjet printhead (not shown). The printhead of the inkjet printing device is used to print reverse images 140 on any suitable transparent media 135, such as a specially coated polyester media. The transparent media 135 is later laminated to a suitable material, such as a polyvinyl chloride (PVC) or Acrylonitrile-butadiene-styrene (ABS) card 150 with the side with the printed image being adhered to the card as a normal view 160. Although PVC or ABS card are preferred, cards of other material may equally be used without departing from the scope of the invention.

## II. OPERATION

Referring back to FIG. 1, in operation, in general, the images are

processed by a host computer or the printer 130 and translated and transposed to form mirror images 140 (reverse images). Transparent media 135, such as specially coated polyester media, preferably as a roll, is located in a supply area of the printer 130 and mechanically picked up and moved  
5 toward a print zone. At the proper time, the inkjet printing device 130 starts printing a reverse image 140 on the transparent media 135. The transparent media 135 can be specially coated with any suitable material to absorb and control the amount of ink spread to allow the dispensed ink to remain on the transparent media 135.

10 Specifically, the printer 130 responds to commands from the image processing controller 100 of FIG. 1 and software drivers by printing reverse full color or black print images 140 on the transparent media 135. The transparent media 135 can be mechanically retrieved from a medium holding area as pre cut sheets or can be dispensed from a roll (not shown). It should  
15 be noted that the printhead can be moving and the media 135 can be stationary so that the printhead is moving both axes or vice versa.

After being printed on, the transparent media 135 can be held temporarily in an output area to allow the ink to dry. A hot air dryer can be used to speed up the drying process (not shown). Once the reverse printed  
20 image 140 on the transparent media 135 has dried, it can be laminated on a standard plastic card 150 with the side with the images being adhered.

The edges of the transparent media 135 can be cut so that they are flush with the edge of the plastic card 150. The card 150 is then ejected to an output area, and is ready to use. As a result, the images 160 are viewed as  
25 being printed correctly on the transparent media 135. Further, the images 160 are protected on one side by the transparent media 135 itself and on the other side by the plastic card 150. Consequently, the produced ID card is a fairly durable.

It should be noted that the card 150 could be coated with a pressure  
30 sensitive adhesive commonly available. The adhesive could be in the form of a transfer tape or a double-sided tape. The coating can act as an ink receptor and adhesive. The excess transparent media or adhesive tape (if used) could be removed using a die cut process.

The above described process could occur automatically. That is, the

printer itself could contain a supply of standard plastic cards that could be pre-coated with the adhesive or the adhesive can be put on the card while in the printer. In one embodiment, the printer could align the printed image with the card then laminate the transparent media and the card together using the pressure sensitive adhesive tape. In addition, the excess adhesive and transparent media may be removed by a die cut process contained in the printer itself.

FIGS. 2 and 3 illustrate a reverse printed image and the image, respectively. FIG. 2 represents the image 210 as printed by the printer 130 on the transparent media 135 of FIG. 1. As can be seen, FIG. 2 is the mirror image of FIG. 3. Hence, when FIG. 2 is laminated on the plastic card 150 of FIG. 1 with the side having the printed image being adhered to the card, it becomes FIG. 3.

In FIGS. 2 and 3, photo image 210 and 310 is the photo of the individual to whom the card will be issued. Info1 (215 and 315) may be the individual's address. Info2 (220 and 320) may be the individual's date of birth and Info3 (225 and 325) may be the individual's ID number.

### III. CONCLUSION

The present invention uses an inkjet printing device to print images on ID cards. Normally, inkjet printed images are not too durable. The images are usually susceptible to damage due to scratches, contact with water, high heat, humidity etc. However according to the present invention, the images are protected on one side by the transparencies and on the other side by the plastic card. Consequently, ID card images of the present invention are relatively very durable.

In addition, inkjet printing is relatively inexpensive and also allow ink mixture to produce a huge array of different colors. Hence, ID cards produced in accordance with the present invention are relatively inexpensive and images, such as photographs of individuals, appear more realistic as the colors are closer to real life colors.

The foregoing has described the principles, preferred embodiments and modes of operation of the present invention. However, the invention should not be construed as being limited to the particular embodiments

discussed. As an example, the above-described inventions can be used in conjunction with any inkjet printer. Thus, the above-described embodiments should be regarded as illustrative rather than restrictive, and it should be appreciated that variations may be made in those embodiments by workers skilled in the art without departing from the scope of the present invention as defined by the following claims.

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**CLAIMS**

- 5           1.       An inkjet printing device for printing identification cards, comprising:  
              an input area for holding transparent media; and  
              an inkjet printhead for printing reverse images on portions of the  
transparent media.
2.       The inkjet printing device of claim 1, wherein the transparent media is  
a roll of polyester media.
- 10           3.       The inkjet printing device of claim 2, wherein the transparent media is  
coated with a material to absorb and control the amount of ink spread to allow the  
dispensed ink to remain on the transparent media.
4.       The inkjet printing device of claim 3, wherein each printed portion of  
15 the transparent media is laminated to a plastic card, the side of the transparent  
media containing the images being adhered to the card.
5.       The inkjet printing device of claim 4, wherein an adhesive tape is  
used to laminate the transparent media to the card.
- 20           6.       The inkjet printing device of claim 5, wherein the images include a  
photographic image as well as alphanumerical data of an individual.
7.       The inkjet printing device of claim 6, wherein the laminated plastic  
25 card is automatically cut by the printing device as an identification card.
8.       The inkjet printing device of claim 7, further comprising a hot air dryer  
to dry the images on the transparent media before the transparent media is  
laminated to the plastic card.
- 30           9.       The inkjet printing device of claim 8, wherein the transparent media is  
automatically laminated to the plastic card.
10.      The inkjet printing device of claim 9, further comprising a die cut to  
35 automatically cut the laminated plastic card into the identification card.

11. A method of producing an identification card comprising:  
 creating a digital file having images and text; and  
 sending the digital file to an inkjet printing device to be printed, the  
 5 inkjet printing device comprising an input are for holding transparent media and an  
 inkjet printhead for reversibly printing the images and text on a portion of the  
 transparent media.

12. The method of claim 11, wherein the transparent media is a roll of  
 10 polyester media.

13. The method of claim 12, wherein the polyester roll is coated with a  
 material to absorb and control the amount of ink spread to allow the dispensed  
 ink to remain on the portion of the polyester media.

14. The method of claim 13, wherein each polyester roll is laminated to a  
 plastic card, the side of the polyester media containing the images being adhered to  
 the card.

15. The method of claim 14, wherein an adhesive tape is used to  
 20 laminate the polyester media to the card.

16. The method of claim 15, wherein the laminated plastic card is cut into  
 an identification card.

17. The method of claim 16, further comprising a hot air dryer to dry the  
 images on the polyester media before the polyester media is laminated to the  
 plastic card.

18. The method of claim 17, wherein the polyester media is automatically  
 30 laminated to the plastic card.

19. The method of claim 18, wherein the inkjet printing device further  
 comprises a die cut to automatically cut the laminated plastic card into the  
 35 indemnification card.

**METHOD AND SYSTEM OF PRINTING  
IDENTIFICATION CARD (ID) USING AN INKJET PRINTER**

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By Maher et al.

**ABSTRACT OF THE DISCLOSURE**

The present invention is embodied in a printing system for printing  
identification cards with durable full-color images using an inkjet printing  
10 device. In general, the present invention provides an inkjet printing device  
that is used to print images on a plastic identification card. The images are  
printed reversibly on a transparent media. The transparent media is then  
laminated onto a plastic card with the side with the images being adhered to  
the card. As a result, the images are viewed as being printed correctly on the  
15 transparent media. Further, the images are protected on one side by the  
transparent media itself and on the other side by the plastic card.

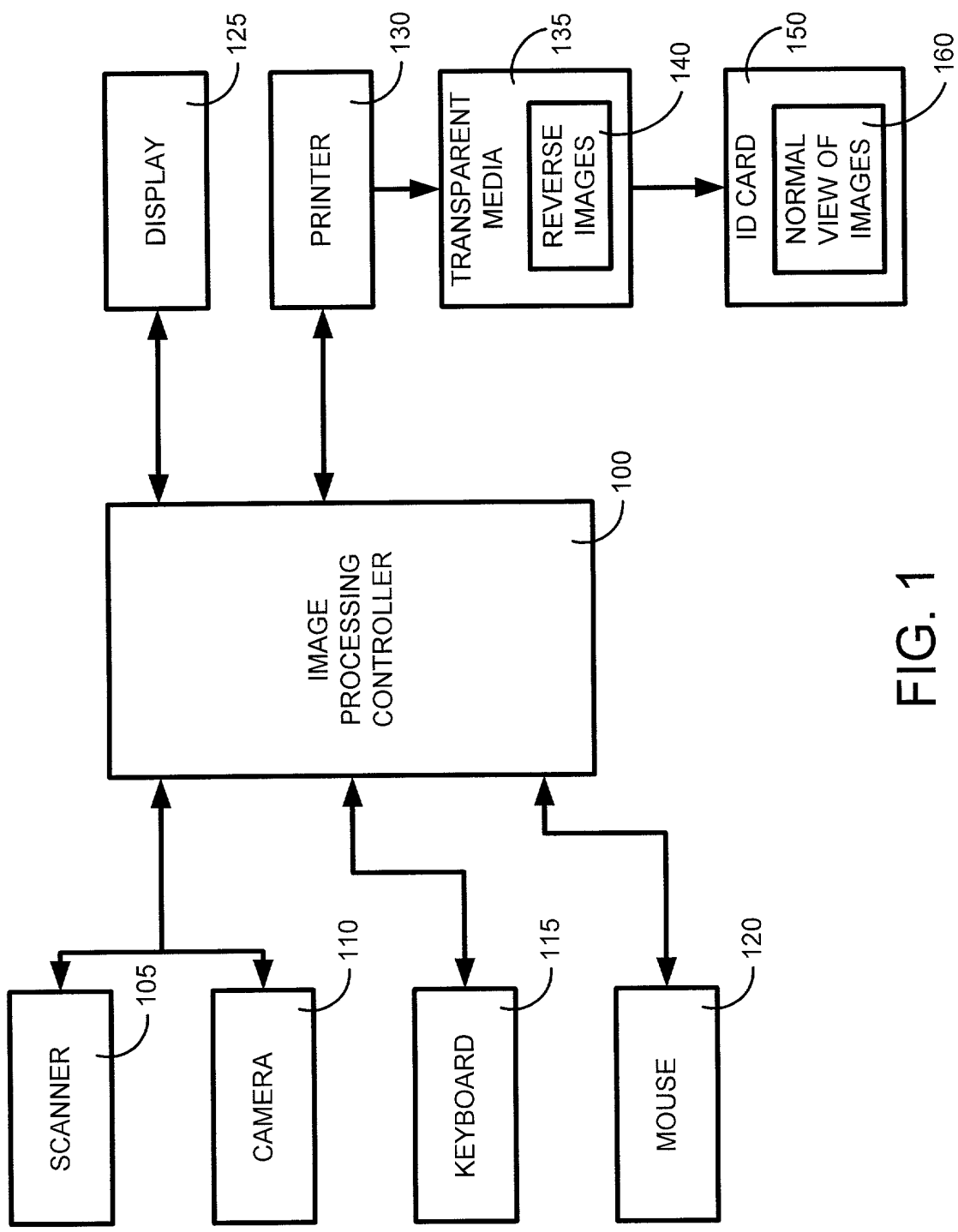


FIG. 1

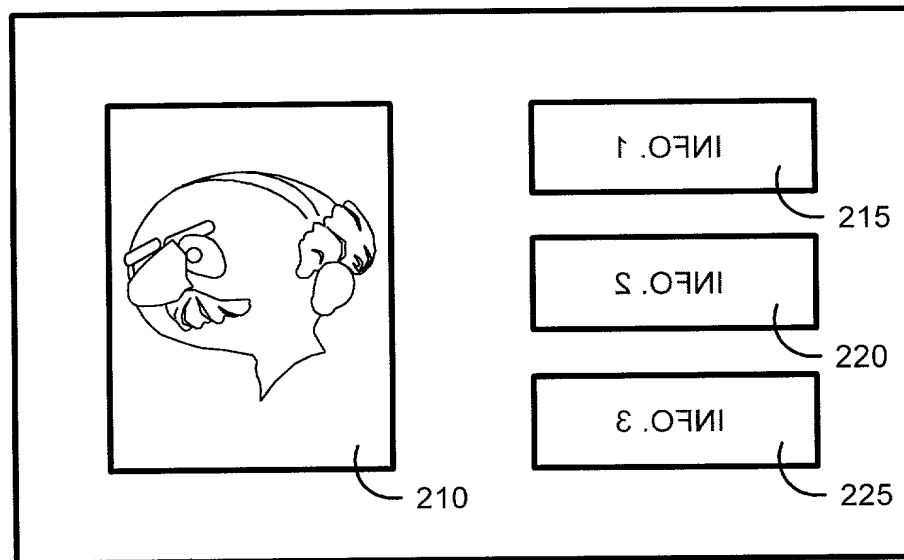


FIG. 2

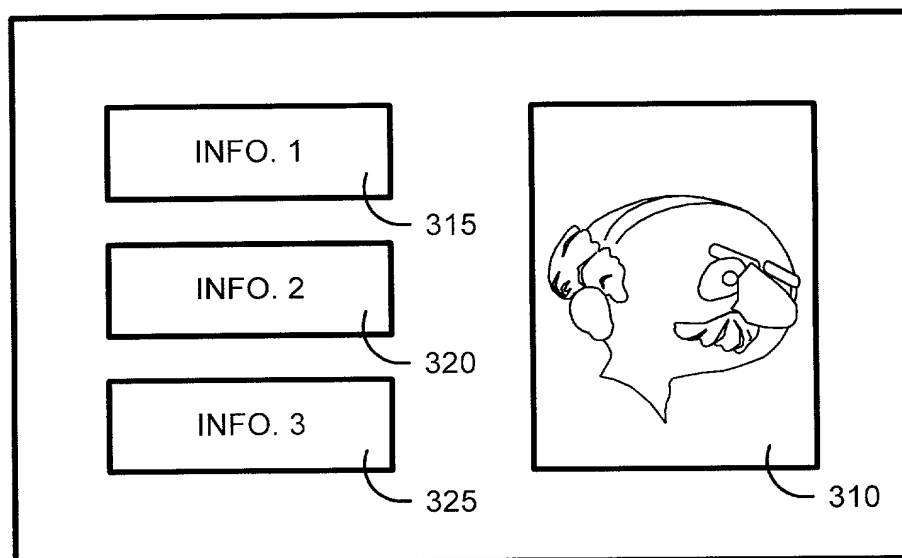


FIG. 3

**DECLARATION AND POWER OF ATTORNEY  
FOR PATENT APPLICATION**ATTORNEY DOCKET NO. 10992667-1

As a below named inventor, I hereby declare that:

My residence/post office address and citizenship are as stated below next to my name;

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

**METHOD AND SYSTEM OF PRINTING IDENTIFICATION CARD (ID) USING AN INKJET PRINTER**

the specification of which is attached hereto unless the following box is checked:

( ) was filed on \_\_\_\_\_ as US Application Serial No. or PCT International Application Number \_\_\_\_\_ and was amended on \_\_\_\_\_ (if applicable).

I hereby state that I have reviewed and understood the contents of the above-identified specification, including the claims, as amended by any amendment(s) referred to above. I acknowledge the duty to disclose all information which is material to patentability as defined in 37 CFR 1.56.

**Foreign Application(s) and/or Claim of Foreign Priority**

I hereby claim foreign priority benefits under Title 35, United States Code Section 119 of any foreign application(s) for patent or inventor(s) certificate listed below and have also identified below any foreign application for patent or inventor(s) certificate having a filing date before that of the application on which priority is claimed:

COUNTRY	APPLICATION NUMBER	DATE FILED	PRIORITY CLAIMED UNDER 35 U S C 119
			YES. _____ NO. _____
			YES. _____ NO. _____

**Provisional Application**

I hereby claim the benefit under Title 35, United States Code Section 119(e) of any United States provisional application(s) listed below:

APPLICATION SERIAL NUMBER	FILING DATE

**U. S. Priority Claim**

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code Section 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, Section 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

APPLICATION SERIAL NUMBER	FILING DATE	STATUS (patented/pending/abandoned)

**POWER OF ATTORNEY:**

As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith:

Customer Number

022879

Place Customer  
Number Bar Code  
Label hereSend Correspondence to:  
**HEWLETT-PACKARD COMPANY**  
Intellectual Property Administration  
P.O. Box 272400  
Fort Collins, Colorado 80527-2400

Direct Telephone Calls To:

**Edmond A. DeFrank**  
(818) 832-1945

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Inventor's Signature

Date

**DECLARATION AND POWER OF ATTORNEY  
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ATTORNEY DOCKET NO. 10992667-1

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Residence: \_\_\_\_\_

Post Office Address: \_\_\_\_\_

Inventor's Signature \_\_\_\_\_ Date \_\_\_\_\_

Full Name of # 4 joint inventor: \_\_\_\_\_ Citizenship: \_\_\_\_\_

Residence: \_\_\_\_\_

Post Office Address: \_\_\_\_\_

Inventor's Signature \_\_\_\_\_ Date \_\_\_\_\_

Full Name of # 5 joint inventor: \_\_\_\_\_ Citizenship: \_\_\_\_\_

Residence: \_\_\_\_\_

Post Office Address: \_\_\_\_\_

Inventor's Signature \_\_\_\_\_ Date \_\_\_\_\_

Full Name of # 6 joint inventor: \_\_\_\_\_ Citizenship: \_\_\_\_\_

Residence: \_\_\_\_\_

Post Office Address: \_\_\_\_\_

Inventor's Signature \_\_\_\_\_ Date \_\_\_\_\_

Full Name of # 7 joint inventor: \_\_\_\_\_ Citizenship: \_\_\_\_\_

Residence: \_\_\_\_\_

Post Office Address: \_\_\_\_\_

Inventor's Signature \_\_\_\_\_ Date \_\_\_\_\_

Full Name of # 8 joint inventor: \_\_\_\_\_ Citizenship: \_\_\_\_\_

Residence: \_\_\_\_\_

Post Office Address: \_\_\_\_\_

Inventor's Signature \_\_\_\_\_ Date \_\_\_\_\_